

# **FABRICATION AND OPTIMIZATION OF CYANOACRYLATE NANOCOMPOSITES FOR ION BEAM ETCHING PROCESS ON HARD DISK SLIDER**

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NANOCOMPOSITES FOR ION BEAM ETCHING PROCESS ON HARD  
DISK SLIDER**

**by**

**TEOH HUI CHIANG**

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## LIST OF SYMBOLS

$H_1$	Alternative hypothesis
$v$	Average phonon velocity
cP	Centipoise
$\Delta x$	Change in x
$\Delta y$	Change in y
$I_{cure}$	Cure index
°	Degree
°C	Degree Celsius
°F	Degree Fahrenheit
$\rho_f$	Density of filler
$\rho_m$	Density of matrix
$K_e$	Effective thermal conductivity
eV	Electron-volt
E	Energy
g	Gram
g/cm <sup>3</sup>	Gram per cubic centimeter
$R_k$	Interfacial thermal resistance
K	Kelvin
kN	Kilo newton
kHz	Kilohertz
MPa	Mega pascal
μm	Micrometre
mg	Milligram

ml	Millilitre
mm	Millimetre
mPa.s	Millipascal seconds
min	Minute
nm	Nanometer
H <sub>0</sub>	Null hypothesis
Ω-m	Ohm meter
Ω/sq	Ohm per square
%	Percentage
<i>l</i>	Phonon mean free path
π	Pi
Pt	Point
psi	Pounds per square inch
P	Power
cm <sup>-1</sup>	Reciprocal of meters
rpm	Revolutions per minute
Hz	Revolutions per second
S/m	Siemens per meter
<i>C<sub>p</sub></i>	Specific heat capacity per unit volume
m <sup>2</sup> /g	Square meter per gram
sccm	Standard cubic centimeter per minute
ρ <sub>s</sub>	Surface resistivity
E	Tensile modulus
σ <sub>max</sub>	Tensile strength
λ	Thermal conductivity

$K_m$	Thermal conductivity of the matrix
$t$	Time
$W_F$	Total weight of filler
$W_T$	Total weight of uncured mixture
$\epsilon_{ult}$	Ultimate strain
$V$	Volt
$V_f$	Volume fraction of filler
vol. %	Volume percentage
$\rho_v$	Volume resistivity
$W$	Watt
$W/m.K$	Watts per meter-kelvin
$W_f$	Weight fraction of filler
wt. %	Weight percentage

## LIST OF ABBREVIATIONS

1D	One dimensional
2D	Two dimensional
ABS	Air-bearing surface
Ag	Silver
Al	Aluminum
Al <sub>2</sub> O <sub>3</sub>	Aluminum oxide
ATR	Attenuated total reflectance
BN	Boron nitride
CB	Carbon blacks
CI	Confidence Interval
CNTs	Carbon nanotubes
Coef	Coefficient
Cu	Copper
CVD	Chemical vapor deposition
DF	Degree of freedom
Dia.	Diameter
DOE	Design of experiment
ESD	Electrostatic discharge
F-value	F distribution
FESEM	Field Emission Scanning Electron Microscopy
FTIR	Fourier transform infrared spectroscopy
GLM	General linear model
GO	Graphene oxide